

What is claimed is:

1. A method of manufacturing an electron-emitting device having an electroconductive film including an electron-emitting region arranged between a pair of device electrodes, characterized in that the process of forming an electroconductive film including an electron-emitting region comprises steps of applying a liquid containing the material of the electroconductive film to a substrate by an ink-jet method and thereafter detecting any defective condition in the applied liquid and applying the liquid containing the material again to the area detected for a defective condition in said applied liquid by an ink-jet method.
2. A method of manufacturing an electron-emitting device according to claim 1, wherein said step of detecting a defective condition in the applied liquid comprises a step of examining a precursor film of the electroconductive film formed by drying the applied liquid.
3. A method of manufacturing an electron-emitting device according to claim 2, wherein said step of examining a precursor film comprises a step of examining the location of said precursor film.
4. A method of manufacturing an electron-emitting

device according to claim 2, wherein said step of examining a precursor film comprises a step of examining the profile of said precursor film.

5 5. A method of manufacturing an electron-emitting device according to claim 2, wherein said step of examining a precursor film comprises a step of examining the presence or absence of a foreign object on said precursor film.

10 6. A method of manufacturing an electron-emitting device according to claim 2, wherein said step of applying the liquid containing the material again is conducted after a step of applying the solvent of the 15 material to the precursor film detected to be defective by the step of examining the precursor film.

20 7. A method of manufacturing an electron-emitting device according to claim 6, wherein said solvent to be applied to the precursor film detected to be defective is the solvent used for the said liquid containing the material of said electroconductive film.

25 8. A method of manufacturing an electron-emitting device according to claim 6, wherein said solvent to be applied to the precursor film detected to be defective is a solvent containing a ligand which is chelatable

with a component element of said precursor film.

9. A method of manufacturing an electron-emitting device according to claim 6, wherein said application 5 of the solvent of said precursor film is performed by means of an ink-jet system.

10. A method of manufacturing an electron-emitting device according to claim 2, wherein 10 said step of applying the liquid containing the material again is conducted after a step of applying the solvent to the precursor film detected to be defective in the step of examining said precursor film and heating the applied solvent.

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11. A method of manufacturing an electron-emitting device according to claim 10, wherein the solvent to be applied to the precursor film detected to be defective is the solvent used for the 20 liquid containing the material of said electroconductive film.

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12. A method of manufacturing an electron-emitting device according to claim 10, wherein the solvent to be applied to the precursor film detected to be defective is a solvent containing a ligand which is chelatable with a component element of

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said precursor film..

13. A method of manufacturing an
electron-emitting device according to claim 10, wherein
5 said application of the solvent of said precursor film
is performed by means of an ink-jet system.

14. A method of manufacturing an
electron-emitting device according to claim 2, wherein
10 said step of applying the liquid containing the
material again is conducted after a step of applying
the solvent to the precursor film detected to be
defective in the step of examining said precursor film,
heating the applied solvent and thereafter exposing the
15 applied and heated region to a reducing atmosphere.

15. A method of manufacturing an
electron-emitting device according to claim 14, wherein
the solvent to be applied to the precursor film
20 detected to be defective is the solvent used for the
liquid containing the material of said
electroconductive film.

16. A method of manufacturing an
electron-emitting device according to claim 14, wherein
25 the solvent to be applied to the precursor film
detected to be defective is a solvent containing a

ligand which is chelatable with a component element of said precursor film.

17. A method of manufacturing an
5 electron-emitting device according to claim 14, wherein
said application of the solvent of said precursor film
is performed by means of an ink-jet system.

18. A method of manufacturing an
10 electron-emitting device according to claim 2, wherein
said step of applying the liquid containing the
material again is conducted after a step of applying
the solvent to the precursor film detected to be
defective in the step of examining said precursor film
15 and sucking the solvent.

19. A method of manufacturing an
electron-emitting device according to claim 18, wherein
the solvent to be applied to the precursor film
20 detected to be defective is the solvent used for the
liquid containing the material of said
electroconductive film.

20. A method of manufacturing an
25 electron-emitting device according to claim 18, wherein
the solvent to be applied to the precursor film
detected to be defective is a solvent containing a

ligand which is chelatable with a component element of
said precursor film.

21. A method of manufacturing an
5 electron-emitting device according to claim 18, wherein
said application of the solvent of said precursor film
is performed by means of an ink-jet system.

22. A method of manufacturing an
10 electron-emitting device according to claim 1, wherein
said step of detecting a defective condition in the
applied liquid comprises a step of examining the
electroconductive film formed by drying and heating the
applied liquid. (A)

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23. A method of manufacturing an
electron-emitting device according to claim 22, wherein
said step of examining the electroconductive film
comprises a step of measuring the electric resistance
20 of the electroconductive film.

24. A method of manufacturing an
electron-emitting device according to claim 22, wherein
said step of applying the liquid containing the
25 material again is conducted after a step of removing
the electroconductive film detected to be defective as
a result of examination of said electroconductive film.

25. A method of manufacturing an
electron-emitting device according to claim 24, wherein
said step of removing the electroconductive film
detected to be defective comprises a step of taking up
5 the defective electroconductive film by means of an
adhesive medium.

26. A method of manufacturing an
electron-emitting device according to claim 22, wherein
10 said step of applying the liquid containing the
material again is conducted after a step of exposing
the electroconductive film detected to be defective as
a result of examining the electroconductive film to a
reducing atmosphere and thereafter removing the
15 electroconductive film.

27. A method of manufacturing an
electron-emitting device according to claim 26, wherein
said step of removing the electroconductive film
20 detected to be defective comprises a step of taking up
the defective electroconductive film by means of an
adhesive medium.

28. A method of manufacturing an
25 electron-emitting device according to claim 1, wherein
said step of detecting a defective condition in the
applied liquid comprises a step of examining the

electroconductive film including the electron-emitting region formed in the electroconductive film formed by drying and heating the applied liquid.

5 29. A method of manufacturing an electron-emitting device according to claim 28, wherein said step of examining said electroconductive film including said electron-emitting region comprises a step of observing the relationship between the voltage
10 (Vf) applied to the electroconductive film including the electron-emitting region and the electric current (If) caused to flow by the applied voltage.

15 30. A method of manufacturing an electron-emitting device according to claim 28, wherein said step of examining said electroconductive film including said electron-emitting region comprises a step of observing the relationship between the voltage (Vf) applied to the electroconductive film including the electron-emitting region and the electric current (If) caused to flow by the applied voltage and determining by calculation the peak value of (d^2If/dVf^2) from said relationship between Vf and If.

25 31. A method of manufacturing an electron-emitting device according to claim 28, wherein said step of applying the liquid containing the

material again is conducted after a step of exposing
the electroconductive film detected to be defective as
a result of examining the electroconductive film
including the electron-emitting region to a reducing
5 atmosphere and subsequently removing the
electroconductive film.

32. A method of manufacturing an
electron-emitting device according to claim 31, wherein
10 said step of removing the electroconductive film
including the electron-emitting region and detected to
be defective comprises a step of taking up the
defective electroconductive film including the
electron-emitting region by means of an adhesive
15 medium.

33. A method of manufacturing an
electron-emitting device according to any of claims 1
through 32, wherein said ink-jet systems is a system of
20 ejecting liquid drops from a nozzle as a piezo-electric
element arranged therein is deformed.

34. A method of manufacturing an
electron-emitting device according to any of claims 1
through 32, wherein said ink-jet systems is a system of
25 ejecting liquid drops from a nozzle by heating the
liquid and causing it to bubble.

35. A method of manufacturing an electron source comprising a plurality of electron-emitting devices arranged on a substrate, each having an electroconductive film including an electron-emitting region and formed between a pair of device electrode, characterized in that said electron-emitting devices are manufactured by a method according to any of claims 1 through 32.
- 10 36. A method of manufacturing an electron source according to claim 35, wherein said ink-jet systems is a system of ejecting liquid drops from a nozzle as a piezo-electric element arranged therein is deformed.
- 15 37. A method of manufacturing an electron source according to claim 35, wherein said ink-jet systems is a system of ejecting liquid drops from a nozzle by heating the liquid and causing it to bubble.
- 20 38. A method of manufacturing an image-forming apparatus comprising an electron source formed by arranging a plurality of electron-emitting devices on a substrate, each having an electroconductive film including an electron-emitting region formed between a pair of device electrodes, and an image-forming section for forming an image by irradiation of electrons emitted from the electron source, characterized in that

sayd electron-emitting devices are manufactured by a method according to any of claims 1 through 32.

39. A method of manufacturing an image-forming apparatus according to claim 38, wherein said ink-jet systems is a system of ejecting liquid drops from a nozzle as a piezo-electric element arranged therein is deformed.
- 10 40. A method of manufacturing an electron source according to claim 38, wherein said ink-jet systems is a system of ejecting liquid drops from a nozzle by heating the liquid and causing it to bubble.

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